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ABSTRACT

At the Purdue University School of Technology (PST) at Columbus, Indiana, the Total Quality Management (TQM) philosophy was used in the computer laboratories to better meet student needs. A customer satisfaction survey was conducted to gather data on lab facilities, lab assistants, and hardware/software; other sections of the survey included demographics, general comments, and suggestions for improvements. The quality tool, Plan-Do-Check-Act (PDCA), was used to implement change and improve processes in the computer labs. Following a brief background of the school, computer personnel, and computer labs, this paper describes the sample, survey, and results of the TQM approach. Solutions that were developed to solve lab assistant quality dimension problems are listed. Survey results are provided in eight figures. The Computer Labs Customer Satisfaction Survey questionnaire is appended. (AEF)

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TQM in a Computer Lab

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Introduction:

TQM is a philosophy that can be applied to any aspect of work or life. With this philosophy and a set of quality tools, one can transform the way work is done to meet customer needs, besides delighting the customer. At Purdue University School of Technology the Columbus Campus, we used the TQM philosophy in our computer lab to try and better met our customer (students) needs. We conducted a customer satisfaction survey, compiled the data, and implemented PDCA. Since we are currently involved in this endeavor, we still need to measure the results and continuously improve.

Background of School:

Purdue University School of Technology at Columbus Indiana (PST) is a unique partnership between education and business, industry, and government. It was established, along with eight other regional campuses, to meet Indiana's need for trained technologists and technicians. The curriculum at the Columbus campus is the same as Purdue University at West Lafayette, Indiana.

PST is located at the Indiana University Purdue University Columbus (IUPUC) campus. IUPUC is part of the Indiana University regional system. PST partners with IUPUC to offer eight-degree programs. There are 1900 students at this campus, of which over 300 are PST students.

Background of Computer Personnel:

PST maintains two computer labs that are available to PST students, as well as, IUPUC students. PST has a Lab Manager, along with students hired as Lab Assistants to staff the labs. The Lab Manager duties include: hiring, training, scheduling, installing new hardware and software, troubleshooting hardware and software problems, fixing problems, managing PST lab file server, writing and posting lab related documentation (both user and employee-based), and maintaining the lab environment.

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The Lab Assistants duties include: providing assistance to lab users, answering questions, trouble shooting hardware and software problems, assisting in hardware and software installation. Lab Assistants must have taken an introductory computer classes with basics of Windows and Microsoft Office toolset, or has equivalent knowledge. They must also posses good interpersonal skills and be willing to work set hours. Each semester there are approximately 6-9 Lab Assistants depending on their availability.

Background of Computer Lab:

The two PST computer labs include 42 PCs and one printer. Of the 42 PCs, 37 are 486 machines and 5 are Pentiums. The printer is a laser printer that is 4 years old. IUPUC provides one lab with a staff that maintains the labs, which contains 15 PCs and one printer. The labs are in three physically adjacent rooms, with windows in between the labs. This allows one Lab Assistant to cover all three labs.

TQM Approach:

The Sample

A sample of the students at the IUPUC campus was surveyed, concerning customer satisfaction with the PST labs. The surveys were distributed to students in different classes from different programs. A representative sample was from Computer Technology, Organizational Leadership and Supervision, Nursing, Mathematics, and Accounting. The survey was given during the summer and fall 1997 sessions. There were approximately 100 respondents, which represents about six percent of the campus population.

The Survey

The survey followed the Likert-Type format. It contained 22 questions that the customers were to rank from 1 to 5 whether they strongly disagreed, disagreed, undecided, agreed, or strongly agreed, respectively, to the statements. The questions were broken into categories: lab facilities, lab assistants, and hardware/software. Other sections of the survey included: demographics, general comments, and suggestions and improvements to the process. (See attachment)

The Results

Following is a summary of the demographic results of the survey:

Thirty-five percent of the students surveyed were Computer Technology majors. Organizational Leadership and Supervision represented the next largest group at twenty-five percent. The rest distributed among twenty majors. Eighty-eight percent of the students are a junior or less and thirty-four percent are sophomores. Most of the students considered themselves novices with PCs. Two-thirds have a home computer. Slightly over half of the respondents use the lab one or more times a week with sixty-five percent saying that they use the lab generally on Monday to Thursday between 8:00am. -4:30pm.
(See Figures 1-5).

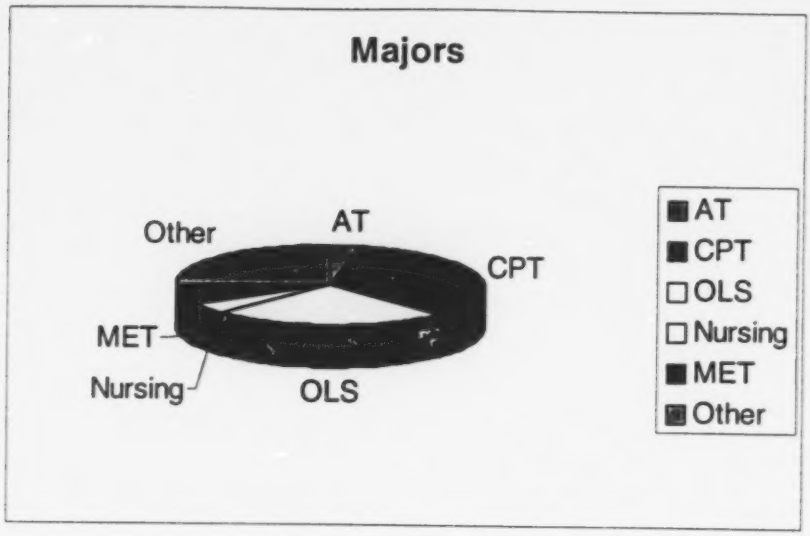

Figure 1

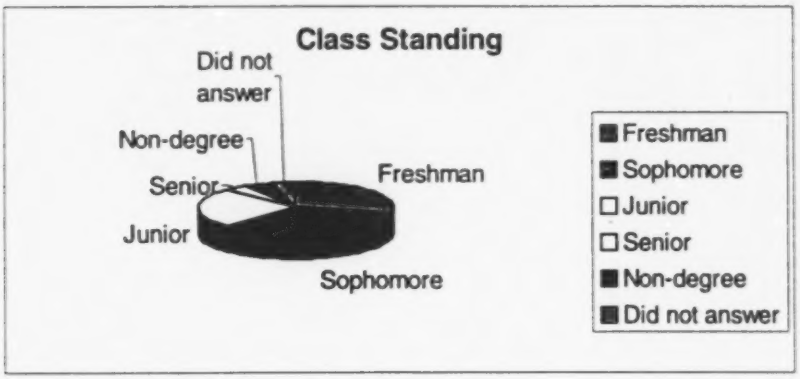

Figure 2

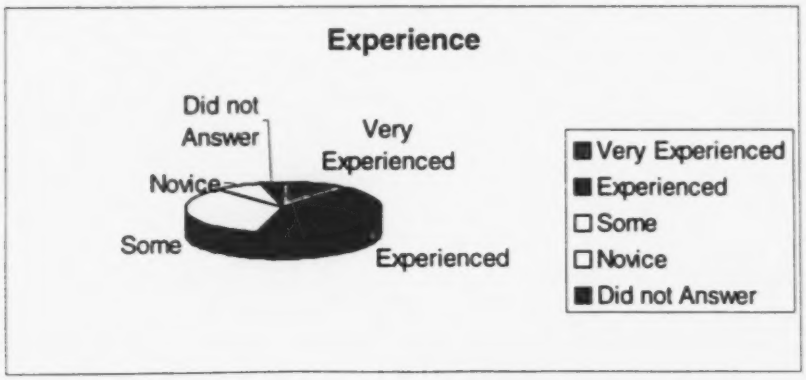

Figure 3

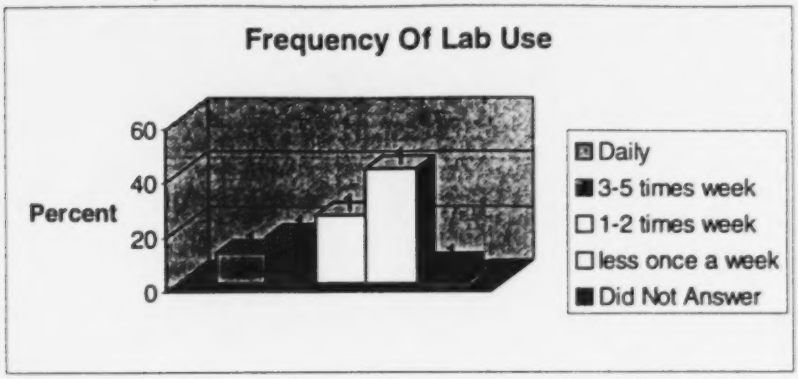

Figure 4

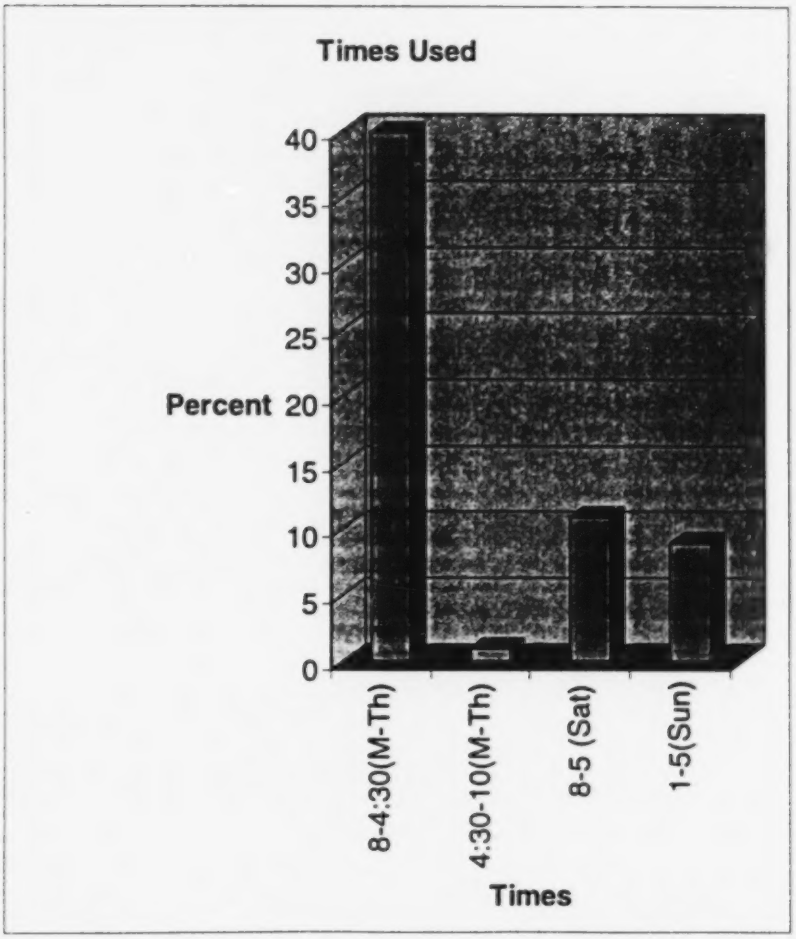

Figure 5

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Following is a summary of the question results of the survey:

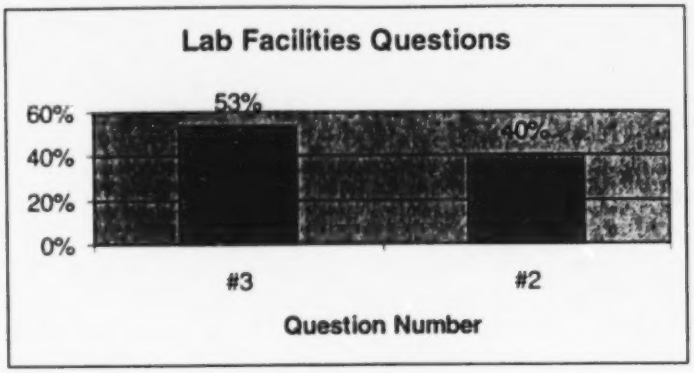

Figure 6

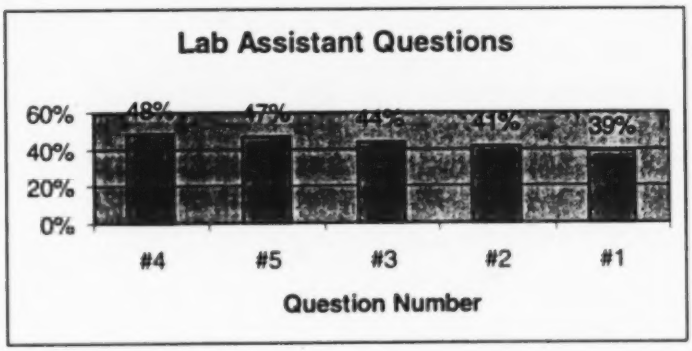

Figure 7

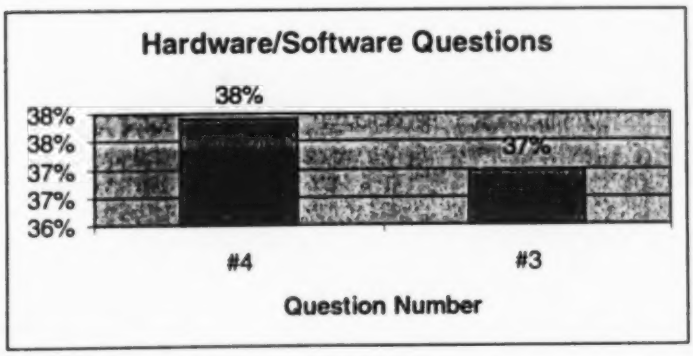

Figure 8

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PDCA

We decided to use the quality tool, Plan-Do-Check-Act (PDCA) to help implement change and improve our processes in the computer labs. A team of individuals consisting of the head lab assistant, another lab assistant, and the authors of this paper was formed to brainstorm possible solutions to the lab assistant quality dimension problems and to implement these solutions.

Based on the data concerning the Lab Assistants, the team developed the following list of solutions:

12. Make name tags for the lab assistants and the head lab assistant identifying their name and function.
13. Make name plates, i.e. "Lab Assistant" and "Head Lab Assistant" displayed on the respective desks in the computer lab office.
14. Have the head lab assistant generate a list of skills necessary for a lab assistant to possess. This would aid in the selection process and the training process of current and future lab assistants.
15. Have the head lab assistant schedule a beginning-of-the-semester meeting with all lab assistants to review training issues, changes in the lab facilities, scheduling, expectations, team building, and general information.
16. Work with Continuing education department to allow the head lab assistant to participate (free of charge) in computer classes offered by that department in order to keep her skills from becoming obsolete. This would enable the head lab assistant to, in turn, train the other lab assistants.

Thus far, items 1, 2, and 5 have been implemented. Items 3 and 4 are scheduled for implementation for Fall 1998. The team will address the other quality dimensions of the survey when money becomes available to the university to purchase such things as computers, printers, chairs, workstations, etc.

In order to measure our results and see if what was implemented satisfies our customers, the survey will be redistributed at the end of the Fall 1998 semester.

Conclusion

Utilizing TQM techniques in the university computer lab has paid dividends by providing a technique to improve our lab facilities. With limited financial resources it was difficult to address all issues, especially hardware and software issues. With many universities facing similar tight budgets on capital equipment, it is important to note that it was still possible to improve the quality and services provided in the lab. The process is now in place to continuously improve the lab.

References

Hayes, Bob E., Measuring Customer Satisfaction, Milwaukee, Wisconsin, Quality Press, 1998.

Deming, W. Edwards, The New Economics, Cambridge, MA, Massachusetts Institute of Technology, 1994.

COMPUTER LABS
CUSTOMER SATISFACTION SURVEY
1997

Demographics:

1. What is your major? _____
2. What is your level? ___Freshman, ___Sophomore, ___Junior, ___Senior, ___Non-degree
3. How do you rate your computer experience?___Very experienced, ___Experienced,___Some, ___Novice
4. Do you use a computer a work? ___Yes, ___No
5. Do you have a computer at home? ___Yes, ___No
6. How often do you use the computer labs ___Daily, ___3-5 times a week, ___1-2 times week, ___less than once a week
7. What times do you generally use the computer lab? ___8:00am-4:30pm (M-Th), ___4:30pm-10:00pm(M-Th), ___8:00am-5:00pm(Sat), ___1:00pm-5:00pm(Sun)
8. What are the types of software you generally use? ___Word processing, ___Spreadsheets, ___Databases, ___Presentation (Power Point), ___Programming, ___E-mail, ___ Internet Browsing, ___other
9. What is your primary reason for using the computer labs? ___class-related, ___personal, ___both

Please rate the following questions using the scale below.
1 - Strongly Disagree(SD), 2 - Disagree(D), 3- Undecided(U), 4- Agree(A), 5 - Strongly Agree(SA)
Please circle one.

Lab Facilities:	SD	D	U	A	SA
1. The lab facilities are generally clean	1	2	3	4	5
2. The lab facilities are comfortable(temperature, lighting, chairs, desks)	1	2	3	4	5
3. There are ample facilities for use(computers and printers)	1	2	3	4	5
4. Equipment in the lab is in good shape	1	2	3	4	5
5. Lab hours are adequate	1	2	3	4	5
6. Other students are not distracting	1	2	3	4	5
7. The workstation layout is adequate	1	2	3	4	5
Lab Assistants:					
1. Lab assistants are available when you need help	1	2	3	4	5
2. Lab assistants are easily identifiable	1	2	3	4	5
3. Lab assistants are knowledgeable about software problems	1	2	3	4	5
4. Lab assistants are knowledgeable about hardware problems	1	2	3	4	5
5. Lab assistants explain the problem so that you can correct problems yourself in the future	1	2	3	4	5
6. Lab assistants are polite when giving assistance	1	2	3	4	5

Hardware/Software:	SD	D	U	A	SA
1. The hardware is adequate to do the work required	1	2	3	4	5
2. The hardware is generally reliable	1	2	3	4	5
3. Computer performance is good	1	2	3	4	5
4. Computers and printers are up to date	1	2	3	4	5
5. Software is adequate to do the work required(MSOffice, E-mail)	1	2	3	4	5
6. Software is generally reliable	1	2	3	4	5
7. Available software is up to date	1	2	3	4	5
8. The variety of available software is good	1	2	3	4	5
9. Internet access is readily available	1	2	3	4	5

General Comments:
(If you circled 1 or 2, please explain below)

_____
_____
_____
_____

Suggestions and Improvements to the Process

_____
_____
_____